

**REMARKS:**

**A. Pending Claims**

Claims 1-4 were pending in this application. Claims 1-4 have amended. Claims 5-19 are new. Therefore, claims 1-19 are now pending in this application.

**B. The Claims Are Not Indefinite Pursuant To 35 U.S.C. §112, second paragraph**

Claims 1-4 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claims 1-4 for clarification. Applicant submits that the claims are now definite under 35 U.S.C. §112, second paragraph.

**C. The Claims Are Not Obvious Over Herd In View of Seward Pursuant To 35 U.S.C. §103(a)**

Claims 1-4 were rejected under 35 U.S.C. §103(a) as being unpatentable over European Patent Application 0199965 to Herd (hereinafter “Herd”) in view of Seward, Densification of Synthetic fused Silica under Ultraviolet irradiation (hereinafter “Seward”). Applicant respectfully disagrees with these rejections.

To reject a claim as obvious, the Examiner has the burden of establishing a *prima facie* case of obviousness. *In re Warner et al.*, 379 F.2d 1011, 154 U.S.P.Q. 173, 177-178 (C.C.P.A. 1967). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP § 2143.03.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002). *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), MPEP § 2143.01.

A statement that modifications of the prior art to meet the claimed invention would have been “well within the ordinary skill of the art at the time the claimed invention was made” because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). *In re Kotzab* 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000).

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Amended claim 1 describes a combination of features including: “irradiating a layer of silicon oxide deposited in the shallow trenches with short wavelength light to densify the layer of silicon oxide.” Applicant submits that the Examiner has not established a *prima facie* case of obviousness with respect to claim 1, as amended, at least because there is no motivation to combine the cited references.

As a threshold matter, Applicant notes that the Examiner’s assertion that Herd teaches “wherein the oxide is deposited and then irradiated with ultraviolet light.” See Office Action at

3. Applicant submits that this statement is incorrect, as Herd does not teach depositing an “oxide” as the Examiner suggests. Instead, Herd teaches the use of “photopolymers.” *See, e.g.*, Herd at column 5. Accordingly, one of the apparent premises of the Examiner’s rejection is based on a flawed premise, as “photopolymers” are not “oxides,” much less “silicon oxide” as recited in claim 1.

Applicant submits that there is no motivation for combining Herd with Seward, from the Examiner’s flawed premise or otherwise. To achieve the combination of claim 1 from the Herd and Seward references, one of ordinary skill in the art would (among other things) have to be motivated to replace the “photopolymers” of Herd with “silicon oxide,” as is recited in claim 1. Such a modification is not suggested in either Herd or Seward. Furthermore, this modification of Herd would render it unsatisfactory for its intended purpose, which involves “forming isolation regions” by “washing away unexposed regions of said photopolymer coating” and “leaving crosslinked photopolymer 14 in the trenches” *See* Herd at columns 3 and 4. The proposed substitution of silicon oxide in the context of Herd would not allow the “washing away” of Herd to occur, as unexposed silicon oxide would have to be etched away. Thus, if the proposed modification were made, Herd would be rendered unsatisfactory for its intended purpose of “during fabrication, the unexposed or undesired dielectric material may be removed from the wafer surface by simply washing rather than etching.” *See* Herd at column 5. In addition, there is no showing that the proposed substitution of silicon oxide in the context of Herd would produce the “crosslinked photopolymer” of Herd, as the Examiner has not shown that silicon oxide crosslinks under irradiation. Accordingly, Applicant submits that there is no established motivation to modify Herd in view of the teachings of Seward.

For at least this reason, then, Applicant submits that the Examiner has not established a *prima facie* case of obviousness with respect to claim 1 (and, by extension, its dependent claims).

#### **D. New Claims**

Applicant submits that new claims 5-19 add no new matter. Claims 5, 11, and 17 are supported by Applicant’s Specification at least on page 2, lines 16-20 and page 6, lines 6-16.

Claims 6, 12, and 18 are supported by Applicant's Specification at least on page 5, lines 20-23 and lines 31-35. Claims 7, 13, and 19 are supported by Applicant's Specification at least on page 4, lines 26-28. Claim 8 is supported by Applicant's Specification at least from page 4, line 21 to page 5, line 15, page 2, lines 16-20, and page 6, lines 6-16. Claim 14 is supported by Applicant's Specification at least on page 3, line 26 to page 5, line 15. Claims 9 and 15 are supported by Applicant's Specification at least on page 5, lines 16-19. Claims 10 and 16 are supported by Applicant's Specification at least on page 5, lines 19-20.

Claim 8 describes a combination of features including: "irradiating the layer of silicon oxide with short wavelength light to densify the layer of silicon oxide and inhibit the formation of corner areas in the active areas." The cited art does not appear to teach or suggest at least the above-quoted features of claim 8.

Claim 14 describes a combination of features including: "forming a thin layer of thermal silicon oxide along the walls of an active area of a semiconductor device and forming a thin layer of thermal silicon oxide along the walls and bottoms of shallow trenches laterally adjacent to the active area; depositing silicon oxide into the shallow trenches; irradiating the silicon oxide in the shallow trenches with short wavelength light to densify the silicon oxide". The cited art does not appear to teach or suggest at least the above-quoted features of claim 14.

Applicant submits that new claims 8 and 14 describe combinations of features that do not appear to be taught or suggested by the cited art and that claims 8 and 14, and the claims dependent thereon, are in condition for allowance.

**CONCLUSION:**


Applicant submits that the application is in condition for allowance, and an early notice to that effect is requested.

It is believed that no fees are due in association with the filing of this document. If any extension of time is necessary, Applicant hereby requests the appropriate extension of time. If any fees are required, please charge those fees to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account No. 50-1505/5957-07300/GMS.

Respectfully submitted,

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By: \_\_\_\_\_

  
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